



INVESTIGATOR'S ANNUAL REPORT

United States Department of the Interior
National Park Service

All or some of the information you provide may become available to the public.

OMB # (1024-0236)
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Form No. (10-226)

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| Reporting Year: 2010 | Park: Shenandoah NP | Select the type of permit this report addresses: Scientific Study | |
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| Project Title (maximum 300 characters): Shenandoah Watershed Study (SWAS) | | | |
| Park-assigned Study or Activity #: SHEN-00038 | Park-assigned Permit #: SHEN-2010-SCI-0003 | Permit Start Date: Feb 02, 2010 | Permit Expiration Date: Dec 31, 2015 |
| Scientific Study Starting Date: Jan 01, 1990 | | Estimated Scientific Study Ending Date: Dec 31, 2061 | |
| For either a Scientific Study or a Science Education Activity, the status is: Continuing | | For a Scientific Study that is completed, please check each of the following that applies: <input type="checkbox"/> A final report has been provided to the park or will be provided to the park within the next two years <input type="checkbox"/> Copies of field notes, data files, photos, or other study records, as agreed, have been provided to the park <input type="checkbox"/> All collected and retained specimens have been cataloged into the NPS catalog system and NPS has processed loan agreements as needed | |
| Activity Type: Research | | | |
| Subject/Discipline: Watershed Management / Assessment | | | |

Purpose of Scientific Study or Science Education Activity during the reporting year (maximum 4000 characters):

The Shenandoah Watershed Study (SWAS) has both scientific and practical resource-management objectives. The underlying scientific objective of the SWAS program has been to improve understanding of hydro-biogeochemical processes and factors that govern ecosystem conditions in SHEN's mountain watersheds. This scientific objective complements a resource management objective that has been defined by the need to document and assess change that is occurring in SHEN's ecosystems.

Findings and status of Scientific Study or accomplishments of Science Education Activity during the reporting year (maximum 4000 characters):

This was the 31st year of watershed monitoring conducted in SHEN by the SWAS program. The monitoring framework currently includes 14 study watersheds selected to represent the major bedrock types in SHEN. Data collection includes quarterly, weekly and hourly sample collection for analysis of stream water composition, and discharge gauging.

The most significant findings or accomplishments for the most recent completed interpretive report period (through 12/31/09) include:

â ¢ In 2009 the acidity levels of all of the 14 SWAS study streams, as indicated by acid neutralizing capacity and pH, were lower than in previous years.

â ¢ In 12 of the 14 streams, mean sulfate concentrations were lower in previous years.

â ¢ In all 14 of the streams, mean nitrate concentrations were lower than in previous years.

â ¢ The occurrence of discharge-driven episodic acidification in the three intensively studied streams was less severe in 2009 than in previous years.

â ¢ Annual discharge in 2009 was near the long-term mean for the five gauged streams.

â ¢ Although a single year's change does not provide a strong basis for comparison, the observed changes are consistent with recovery from both acidification and effects of gypsy moth defoliation that occurred in the 1990s.

In addition to continued monitoring of the 14 study streams in 2010, additional work included a repeat of the regional synoptic sampling survey of western Virginia brook trout streams, including approximately 60 sites in SHEN. This was the 3rd Virginia Trout Stream Sensitivity Study regional survey conducted with the assistance of Trout Unlimited and other volunteers. See: <http://swas.evsc.virginia.edu/VTSSS-2010/Survey.html>. Preliminary analysis of survey results indicate that the surveyed streams were less acidic in 2010 than in the previous surveys conducted in 1987 and 2000.

For Scientific Studies (not Science Education Activities), were any specimens collected and removed from the park but not destroyed during analysis?

No

Funding specifically used in this park this reporting year that was provided by NPS (enter dollar amount):
\$65000

Funding specifically used in this park this reporting year that was provided by all other sources (enter dollar amount):
\$0

List any other U.S. Government Agencies supporting this study or activity and the funding each provided this reporting year:

Paperwork Reduction Act Statement: A federal agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. Public reporting for this collection of information is estimated to average 1.625 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the forms. Direct comments regarding this burden estimate or any aspect of this form to Dr. John G. Dennis, Natural Resources (3127 MIB), National Park Service, 1849 C Street, N.W., Washington, DC 20240.